Photographs

CENTRAL INTELLIGENCE AGENCY

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INTELLIGENCE MEMORANDUM NO. 347

SUBJECT: Vulnerability of the Chromite Industry in Southern Rhodesia

1. Description of the Industry.

Location.

The chromite deposits of Southern Rhodesia are found chiefly in two general areas: (1) the Selukwe and Victoria (or Mashaba) sections near the center of the colony and (2) narrow seams along the northern part of the Great Dyke, which extends in almost a straight north-northeast -- south-southwest line across Southern Rhodesia west of Salisbury and includes the Umvukwe Mountains. Within the areas mentioned the following districts are being exploited on a large scale: Selukwe (approximately 20 miles southeast of Gwelo), Lalapanzi (25 miles northeast of Selukwe), Kalviro (40 miles west-southwest of Salisbury), Darwendale (30 miles west-northwest of Salisbury), and the Umvuke Mountains (40 miles north-northwest of Salisbury). All of the mines are near railways except those in the Umvukwe Mountains, whose output must be hauled 20 to 40 miles by road to the nearest railroad.

Producers.

Most of the chromite production in Southern Rhodesia comes from the Selukwe area, one of the world's most important sources of metallurgical-grade ore because of the high chromic oxide content and large reserves. The second district of importance is the Great Dyke, which extends for some 300 miles. The chromite occurs in bands or layers which, although thin, represent a very large reserve of metallurgical and chemical-grade ores.

The leading producers are the Rhodesian Chrome Mines, Ltd., in the Selukwe area, and the African Chrome Mines, Ltd., in the Great Dyke-Darwendale district. Other important producers are the Rhodesian General Asbestos Corporation, in the Great Dyke and Selukwe areas; the Rhodesian Vanadium Corporation, in the Great Dyke area; the Weil Chrome Mines, Ltd., near Lydiate; and the Cambrai

Note: This report, which has been prepared at the request of the Special Assistant for Intelligence, Department of State, on the basis of immediately available information, has not been coordinated with the intelligence organizations of the Departments of State, the Army, the Navy, and the Air Force. It contains information available to CIA as of 17 January 1951.

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Mine Company, near Concession, east of the Great Dyke area. Still another organization, the Chrome Producers (Rhodesia), Ltd., is a marketing outlet for several small mining operators.

Methods.

Methods of mining chromite in Southern Rhodesia vary. In the Selukwe area the first chromite deposits were exploited by quarrying. Later, when the depth became too great for quarrying, top slicing was adopted where the wall rocks were soft enough. As greater depths were reached, the wall rocks became firmer and sublevel stoping was introduced. In the past the Great Dyke seams were mined chiefly by open-cut workings. In the underground mines the resuing method is commonly employed because of the narrowness of the seams.

At a large number of mines the ore is sold without dressing except for selection in mining, sorting by hand, and cobbing. The grade of friable ores is at times raised by crushing, followed by gravity concentration to eliminate silica and other associated minerals not chemically combined with the chromite.

Neil Chrome Mines, Ltd.

Exact information is available for only one mine--the Neil Chrome Mines, Ltd., located on the eastern side of the Great Dyke, 6 miles northeast of Lydiate, which is on the main line of the Rhodesian Railways, Ltd. It also has good road connections with Salisbury, about 35 miles east of Lydiate. The mining property is located on both sides of the Hunyani River, with the greater frontage on the north side. Production has been almost entirely from the north side, as the deposits on the south side are covered by an overburden of considerable depth. In this area, hand methods are used in exploiting open-cut mines. The mining is done by natives working under contract and with a minimum amount of supervision.

The milling plant includes a hammer mill and two James tables. The hammer mill and one James table were installed in 1938, and the other table was added in 1946, bringing the capacity of the plant up to 1,000 tons of washed concentrates per month. Large pieces of ore are broken by hand at the mill before being fed to the hammer mill. Since the ore is mined clean, milling consists essentially of washing rather than concentration. The launders of the James tables are equipped with eight mesh screens, and these oversize screenings are stored for use in crushing and tabling during slack periods. After milling, the ore is trucked 6 miles from the mill to Lydiate. In making this haul, however, the trucks must cross a bridge over a river that flows through the property, and there is some danger that this bridge could be washed out during a flood or be destroyed by sabotage. The Neil Chrome Mines, Ltd., has electric power (550 volts) available at the mill, and the power line could be extended to serve the mine. An abundant supply of water from the Hunyani River is available for milling purposes. When underground mining is undertaken, it is possible that the amount of underground water encountered

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might make pumping necessary.

Transportation.

All Southern Rhodesian chrome ore is shipped by rail and exported through the port of Beira in the Portuguese colony of Mozambique. The ore must be carried distances varying from 400 to 600 miles, depending on the location of the mining area. The ore moves over the Rhodesian Railways, Ltd., to the Rhodesian border, then over the Beira Railway in Mozambique to Beira Harbor. The railways are owned by the respective governments, but they form a continuous single-track line of 3'6" gauge. Telegraph and telephone are used in dispatching trains. Because of a shortage of rolling stock, the railway has been a bottleneck in the shipping of chrome ore; consequently, large stockpiles have accumulated at some of the larger mines.

There are on the Beira Railway (as of 31 December 1948) 49 bridges and 633 culverts. Between Beira and Vila Machado are 41 bridges and 101 culverts; the largest of the bridges has five spans and approaches consisting of eight viaducts across the Pungwe River flats, a distance of 7,659 feet. Between Vila Machado and Macequece are eight bridges and 526 culverts. There are no tunnels on the Beira Railway. Eleven watering stations are located along the route.

In the section about 60 miles long between Beira and Vila Machado, grades are slight and relatively large quantities of freight per train can be hauled. Between Vila Machado and Vila Pery the land becomes higher, and the grade increases rapidly in an almost continuous series of sharp curves, some of which have a radius of only 80 meters, or about 250 feet. Between Vila Pery and Macequece the grades are gentler, but they increase again between Macequece and Umtali, where the railroad climbs rapidly in a series of sharp curves.

In the section of the Rhodesian Railway from Umtali to Salisbury, the line climbs steadily from an elevation of 3,551 feet at Umtali to 5,446 feet at Marandellas and then drops to 4,825 feet at Salisbury. There are 12 bridges, each over 40 feet in length, between Umtali and Salisbury, and 10 bridges between Salisbury and Gwelo.

In 1950 a new railway yard with 10 sidings was being built at Mashipanda (a Portuguese customs station 6 miles below Umtali). This will provide additional storage space for approximately 10,000 tons of freight until it can be moved to Umtali.

Along the line of the Rhodesian Railways, Ltd., marshaling yards and repair facilities are located at Bulawayo, Salisbury, Livingstone, Broken Hill, Gwelo, and Umtali. All are key points, because this railway system is the main route for transportation in both Northern and Southern Rhodesia as well as the outlet for chrome ore. Three marshaling yards--at Salisbury, Gwelo,

and Umtali--are directly connected with the shipment of chrome ore, since ore trains must pass through these points en route to Beira.

Port of Beira.

Beira, located at the mouth of the Pungwe and Busi Rivers, is the chief export port for Southern Rhodesia and other countries of East Africa. Practically all the chrome ore, copper from Northern Rhodesia, and miscellaneous products from other areas of East Africa are exported through Beira. The total of these items plus imports is greater that the port can readily handle, resulting in congestion at the port and need for storage space, which is further accentuated by the fact that the railways serving Beira are not capable of distributing imports as rapidly as they enter the port.

Plans are now under way for improving conditions at the port. A mineral wharf is to be constructed, additional storage space is to be provided, and more equipment to facilitate the handling of products, especially ores, is to be installed.

The port is served by electric power from a municipal power station and a second station located near marshaling yards in the vicinity of the Rungwe and Chiveve wharves.

Because of the exposed position of Beira, a sea wall, the Chiveve Embankment, has been built to prevent the encroachment of the sea.

The facilities of the port at present include a deep-water 2,670-ft. pier capable of handling five sea-going ships drawing up to 30 feet, mooring buoys in the anchorage for six sea-going ships, a lighterage pier 1,460 feet long, and transit sheds and open space for the storage of minerals. The one berth available for the unloading of oil tankers is connected by pipelines with installations of the oil companies.

Twelve miles off the coast at the mouth of the river, there is a pile light, and at Macuti, on the shore 4 miles from Beira, is a lighthouse with a radius of 18 miles. The channel is indicated by luminous buoys, and ships with a draft of 30 feet can enter at high tide. The lowest water on Portella bar is 11 feet 8 inches, but the new President Carmona channel has been dredged to a depth of 17 feet.

Strategic Points.

a. Bridges on roads from mines to railway, such as the bridge across the Munyani River from the Neil Chrome Mines to Lydiate.

b. Electric power lines, such as those to the Neil Chrome Mines.

c. Railway bridges on railways in Rhodesia:

(1) 12 bridges over 40 feet in length between Umtali and Salisbury.
(2) 10 bridges between Salisbury and Gwelo.

d. Mine installations.

e. Railway bridges in Mozambique:

(1) 41 bridges between Beira and Vila Machado.
(2) 8 bridges between Vila Machado and Macequece.

f. Culverts along railway in Mozambique:

(1) 107 between Beira and Vila Machado.
(2) 526 between Vila Machado and Macequece.

g. Curves and steep grades on railroad between Vila Machado and Vila Pery, and between Macequece and Umtali.

h. Watering places along railway in Mozambique, at Beira, Dondo, Lamego, Vila Machado, Nharuchonga, Inchope, Amatongas, Gondola, Vanduzi, Garuso, and Macequece.

i. Watering places along railways in Rhodesia, at Gwelo, Hunter's Road, Que Que, Umniati, Umsweswe, Hartley, Makwiro, Hunyani, Salisbury, Melfort, Theydon, Buddeley, Tsungwesi, Odzi, and Umtali.

j. Railway yards at Machipandi.

k. Marshaling yards and repair facilities on Rhodesian Railways, at Bulawayo, Salisbury, Livingstone, Broken Hill, Gwelo, and Umtali.

l. Electric power stations at Port of Beira.

m. Piers at Port of Beira.

n. Oil pipelines at Port of Beira (their destruction would have chiefly nuisance value, requiring taking of oil elsewhere).

o. Storage facilities at Port of Beira.

p. Railway yards at Port of Beira.

q. Blocking of channels in Beira Harbor.

f. Coaling stations along railways of Southern Rhodesia (their destruction would have chiefly nuisance value, requiring other methods of recoaling), at Gwelo, Que Que, Salisbury, and Umtali.

g. Telegraph and telephone facilities located along railways and used in train despatching.

h. Dams on rivers near Salisbury used for water supply or power.

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2. Present Status of Local Measures to Protect Vulnerable Facilities.

The source of information for the Great Dyke area states that "the major points of danger are the railroad to the port of Beira and the loading facilities in Beira."

a. Mines.

In the Great Dyke area any danger of sabotage is practically eliminated, since the operations are mostly open pit. In the Selukwe area there are some large underground mines (the Railway Block Chrome Mine, for example, the largest producer of chrome in this area, has its central shaft down to the 800-foot level). Such underground operations could be sabotaged by knocking out the hoisting facilities and power plants. Information from the Great Dyke area is that no precautions have been taken to guard the properties. There is no information available regarding the other areas.

b. Railroads.

The source of information for the Great Dyke area also stated that "we have no information of steps taken by the Governments in the Colony (Southern Rhodesia), or in Portuguese East Africa (Mozambique), to guard against sabotage." There is no information that would indicate such action is being taken or contemplated by these governments with regard to the two railroads (Southern Rhodesia Railroad and Beira Railroad) which they own and operate, respectively. The Portuguese Government, for example, is taking no steps whatsoever to protect viaducts, bridges, etc., from Beira to Umtali.

c. Port of Beira.

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The port of Beira is owned and operated by the Portuguese Government.

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There are no fire-fighting facilities on the land in the port area, nor any fire boats. All of the fresh water supply in Beira is obtained from cisterns or wells. There is no water piping system in Beira, so that all fire-fighting water must come from the harbor. "The danger of a serious fire which might cripple the port is very great."

The port is not adequately guarded. Police or military forces are practically nonexistent in Mozambique. The military consists of approximately 200 soldiers who are used mainly for ceremonial occasions by the Governor in Lourenco Marques. 25X1X6RD [redacted] there are between 6 to 10 native

soldiers in Beira whose duty is to guard the Director General's home. The burden of guarding the port falls on the Director of the port authority, who has between 20 to 25 armed custom agents whose main interest is to guard against loss of possible revenues rather than to guard against sabotage. The port area is fenced partly by a solid concrete wall 4 to 5 feet high and about 300 meters long and a steel wire fence 4 to 5 feet high. The fencing is inadequate and would not prevent unauthorized persons from entering the port area.

The two sources of power in Beira, the port power plant (central power plant) in the port area, owned and operated by the port authorities, and the plant located south and outside of the port area are entirely vulnerable to sabotage. The central power plant is not protected by fences or by any other means. It has sufficient generating capacity to take care of the present port loading facilities such as electric cranes, and possibly enough capacity to take care of the new chrome belt conveyor loading facilities which are expected to be completed by September 1961. In the event that the central power plant is knocked out, it is believed that the other power plant has sufficient capacity to take care of the port area. There are no mobile diesel or gasoline-driven electric generating units in the port area.

It has been reported by several sources that the harbor could be blocked by the sinking of a large ship in the channel of the river or across the channel at the inner bar.

The switching system in the railroad yard at Beira is not protected and is extremely vulnerable to sabotage. There are two points where saboteurs could cripple the rail facilities of the port.

Summary

Up to the present time there is no indication that the Southern Rhodesian Government and the Portuguese Government have taken or are taking steps to protect their respective vulnerable facilities for the evacuation of chrome ore from Southern Rhodesia. There is likewise no indication that the mine operators are taking steps to protect the vulnerable mine facilities from sabotage.

5. Security Comment.*

a. Conclusions.

(1) As no appreciable security measures are being enforced, facilities involved in the supply of chromite to the US from Southern Rhodesia are extremely vulnerable to sabotage. The threat of sabotage, however, does not appear to be so great in respect to the actual production operations as to those operations upon which the supply of chromite depends, that is, electric power, railroad, harbor, and shipping facilities. The Port of Beira in Portuguese Mozambique and the single-track railroads over which all chromite ores are transported to the port are particularly vulnerable.

25X6D (2) It is unlikely that responsible authorities can be readily prevailed upon to implement effective security programs.

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* This section, dealing with security, has been prepared by the CIA component responsible for security matters.

Next 2 Page(s) In Document Exempt

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